

Q45WQ

Water Quality

Monitoring System

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PRODUCT WARRANTY

Analytical Technology, Inc. (Manufacturer) warrants to the Customer that if any part(s) of the Manufacturer's equipment proves to be defective in materials or workmanship within the earlier of 18 months of the date of shipment or 12 months of the date of start-up, such defective parts will be repaired or replaced free of charge. Inspection and repairs to products thought to be defective within the warranty period will be completed at the Manufacturer's facilities in Collegeville, PA. Products on which warranty repairs are required shall be shipped freight prepaid to the Manufacturer. The product(s) will be returned freight prepaid and allowed if it is determined by the manufacturer that the part(s) failed due to defective materials or workmanship.

This warranty does not cover consumable items, batteries, or wear items subject to periodic replacement including lamps and fuses.

Gas sensors carry a 12 months from date of shipment warranty and are subject to inspection for evidence of misuse, abuse, alteration, improper storage, or extended exposure to excessive gas concentrations. Should inspection indicate that sensors have failed due to any of the above, the warranty shall not apply.

The Manufacturer assumes no liability for consequential damages of any kind, and the buyer by acceptance of this equipment will assume all liability for the consequences of its use or misuse by the Customer, his employees, or others. A defect within the meaning of this warranty is any part of any piece of a Manufacturer's product which shall, when such part is capable of being renewed, repaired, or replaced, operate to condemn such piece of equipment.

This warranty is in lieu of all other warranties (including without limiting the generality of the foregoing warranties of merchantability and fitness for a particular purpose), guarantees, obligations or liabilities expressed or implied by the Manufacturer or its representatives and by statute or rule of law.

This warranty is void if the Manufacturer's product(s) has been subject to misuse or abuse, or has not been operated or stored in accordance with instructions, or if the serial number has been removed.

Analytical Technology, Inc. makes no other warranty expressed or implied except as stated above

TABLE OF CONTENTS

INTRODUCTION	4
Figure 1 – Typical Water Quality Panel Layout (ATI-0675).....	5
System Assembly	6
AC Power Connection.....	6
Analog Output Connections	7
Common Alarm Output.....	7
System Pressure Transmitter	7
Turbidity Standards Feed System.....	8
Figure 2 – Turbidity Standards Feed System (ATI-0677)	8
Calibration of pH, ORP, or Conductivity	9
Chlorine Analyzer Calibration.....	9

INTRODUCTION

Q45WQ Systems are an integrated collection of individual analyzers configured to provide a multi-parameter water quality monitoring system. It is intended for use in potable water treatment facilities or distribution systems, and is available with a choice of parameters including:

Free Chlorine	0-200 PPB Minimum, 0-20 PPM Maximum
Combined Chlorine	0-200 PPB Minimum, 0-20 PPM Maximum
PH	0-14
ORP	-1000 to +2000 mv
Conductivity	0-200 uS Minimum, 0-S Maximum
Temperature	0-50° C
Turbidity	0-4 NTU Minimum, 0-4000 NTU Maximum
Dissolved Oxygen	0-20 PPM
Particle Counter	0-1000 counts/ml
Inlet Pressure	0-200 PSIG
Sample Flowrate	0-30 GPH

Water Quality Systems are factory assembled on 3/8" thick PVC plate. Water inlet connection is by 1/4" I.D. tubing. A PVC block located at the bottom of the assembly contains a stainless steel hose barb for sample connection. This block contains the sample line pressure transmitter, so no pressure reducing valves should be placed ahead of this connection. The inlet block is factory assembled with the barb fitting on the side of the block. An alternate location is supplied on the bottom of the block if it is more convenient to bring the sample in from below. The alternate location contains a plug and all that's necessary is to swap the hose barb and plug if the alternate inlet is preferred.

Immediately after the inlet block is a Y-Strainer followed by a fixed-flow regulator. The Y-Strainer removes all particles over 40 microns and is meant to protect the fixed flow regulator against any large particles that might enter the system. The screen in the Y-Strainer can be easily removed for cleaning if necessary.

The fixed-flow regulator is designed to maintain a relatively constant sample flow regardless of the line pressure feeding the system. No adjustments or maintenance are required for this component. It will provide a water flow of roughly 0.2 GPM to the monitoring system with inlet pressures of 15-150 PSI.

The fixed-flow regulator discharges into a second PVC support block, and the outlet of that block goes to a 3 way selector valve used to direct flow to the sensing system, or to stop flow and allow the system to be drained. This valve is also used to allow turbidity standards to be fed into the turbidity sensor for calibration. A plug is normally installed at the bottom port of this valve, and must be removed to connect drain tubing or turbidity standards feed tubing.

Q45WQ Systems are built to customer requirements and each one may be a little different. As built layout and electrical drawings are supplied with each system. Also included are individual manuals for each of the analyzers that are part of the system. Power connections and analog outputs are normally wired to central terminal boxes to facilitate customer wiring. This information will be found on individual system drawings.

Q45WQ Water Quality Panel

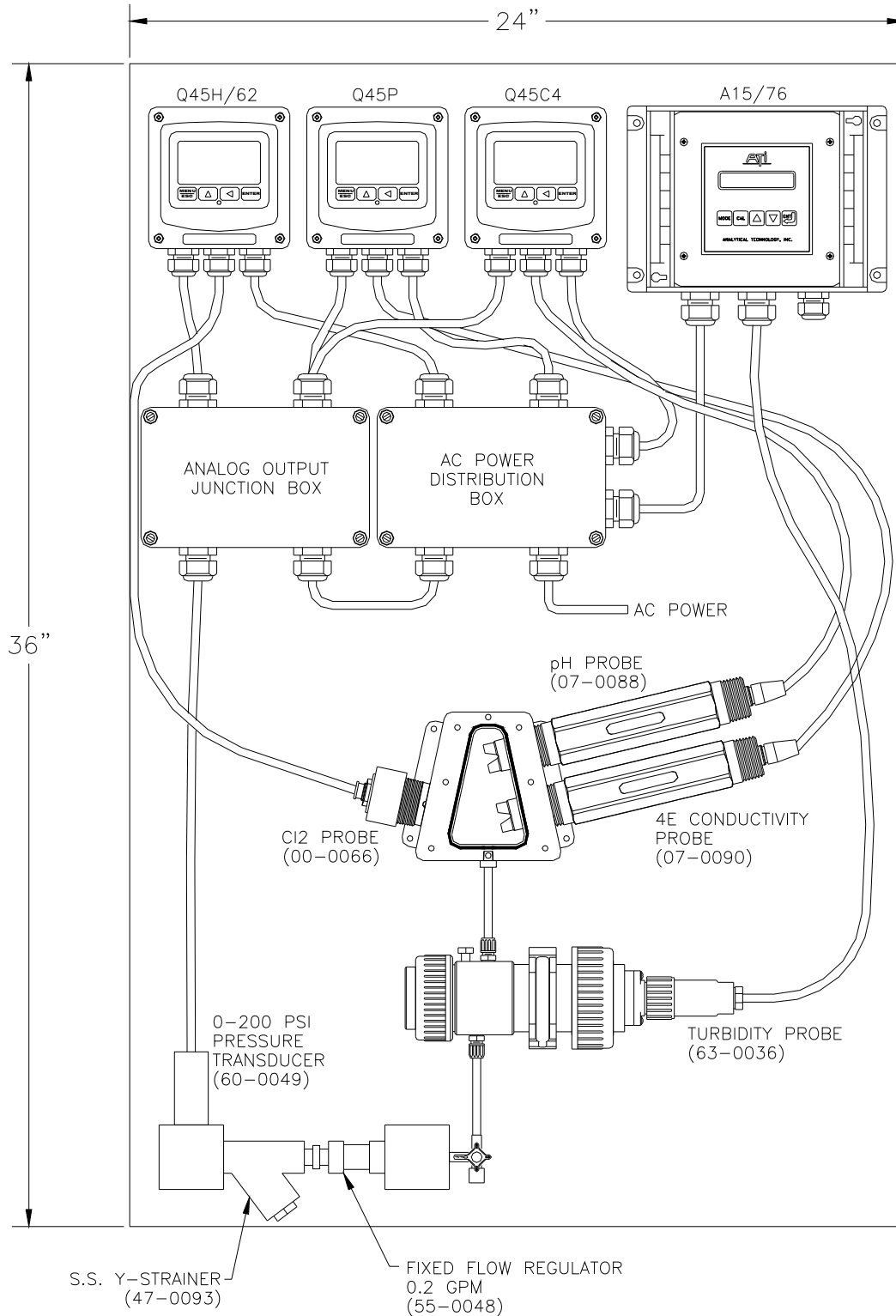


Figure 1 – Typical Water Quality Panel Layout (ATI-0675)

System Assembly

While Q45WQ systems are factory assembled and wet tested, some components are removed and packed separately to facilitate shipment. The user is required to assemble certain items to prepare the system for use. Sensors such as chlorine, pH, ORP, and conductivity are removed from the multi-sensor flowcell and must be installed.

Chlorine sensors are shipped dry, and must be prepared for use by installing a new membrane and fresh electrolyte. See the Q45H manual for details on this procedure. The chlorine sensor slides into a dual o-ring sealed port on the left side of the flowcell.

Conductivity sensors are screwed into the flow chamber and are sealed with Teflon tape to prevent water leakage around the threads. This was done at the factory during testing, but additional Teflon tape may be needed. The conductivity sensor should be installed on the bottom right hand side of the flowcell.

PH sensors are also screwed into the flow chamber, with sealing done in the same way as the conductivity sensor. This sensor is shipped with a rubber wetting boot over the end, and this boot should be removed prior to installation of the sensor into the flowcell.

Turbidity sensors are shipped already installed in the turbidity flowcell and need not be removed. However, if you wish to remove the sensor for examination, unplug the quick-disconnect cable and remove the retaining collar on the right side of the flowcell.

Turbidity monitor electronics are considerably deeper than other analyzer electronics, and the front section of the monitor is removed for shipping. It will be packed in a separate carton that includes sensors and spare parts. The front half of the monitor snaps onto the rear section with quick release hinges and the terminal blocks for sensor and power wiring simply plug into the back. Attach the right hand hinge first so that the enclosure opens to the right and then plug in the terminal blocks. Close the enclosure, taking care not to pinch the cables, and then latch the left hand hinge.

AC Power Connection

An AC power cord is installed at the factory and may be simply plugged into a standard receptacle for operation. If conduit is to be used to bring power to the system, remove the power cord and the gland seal through which the power cord enters the power distribution box and install the ½" conduit hub supplied with the system. Connect conduit as desired, and terminate power to the terminals shown on the system drawing.

AC power is distributed to each analyzer from the AC distribution box. A fused terminal block in this enclosure may be used to turn power on and off. Be sure that the L₁ or Hot line of your power connection is terminated through this terminal block.

Analog Output Connections

Isolated 4-20 mA outputs for each ordered parameter are provided. These outputs are factory wired from each monitor to a common junction box. Your system drawing will identify the terminal positions for each output.

Important Note: Outputs from Q45 Analyzers must be terminated for the analyzers to function. Terminal blocks in the junction box will contain jumpers used during factory testing. These jumpers must be removed when the 4-20 mA outputs are connected to external logging or data transmission equipment. The jumpers are located across the center screws of the DIN rail mounted terminal blocks. A thin bladed screwdriver is needed for removal.

Common Alarm Output

When requested, a common alarm relay may be provided to allow for local enunciation of alarm conditions for any measurement. This is typically done by wiring one alarm from each measured parameter to a common DPDT alarm relay located in the AC distribution box. Local alarms can be wired through the relay contacts as marked on the relay module.

Note that the alarm contacts are unpowered. If you require power for the external alarm device, it must be wired from an external source through the relay contacts.

System Pressure Transmitter

A loop-powered pressure transmitter is provided to allow sample line pressure to be monitored from a remote point. Power for this transmitter is supplied from a 24 VDC power supply located in the AC distribution panel. The DC power is routed through the analog output junction box, through the transmitter, and to the output terminals identified on the system drawing. No adjustments to this transmitter are required. The output of the transmitter is 4-20 mA proportional to 0-200 PSIG.

Turbidity Standards Feed System

Panels that contain turbidity monitors require a method for feeding turbidity standards into the flowcell assembly. A holder assembly is supplied to facilitate this function. The assembly consists of a support bracket that attaches to the top of the multi-sensor flowcell, and a syringe used as a funnel to feed standards into the flowcell. A sketch of this system is shown below.

To feed standard to the flowcell, you must first drain the system. Attach the supplied drain tubing to the bottom port of the 3 way valve and then turn the valve so that the OFF indicator points toward the left, which shuts off the sample inlet. Water will drain from both the multi-sensor flowcell and the turbidity flowcell.

Once the flowcell is empty, connect the feed system in place of the drain tubing. Note that the plunger should be removed from the syringe. Simply pour the standard into the syringe body. It will fill the turbidity flowcell by gravity, and will require about 60 cc of standard. A small amount of standard will run into the multi-sensor flowcell above, which is normal.

After adjustment of the turbidity monitor, put the plunger into the top of the syringe and force the remainder of the standard through the system. With the syringe tube still attached, turn the 3 way valve back to the normal operating position, disconnect the syringe tube, and replace the plug.

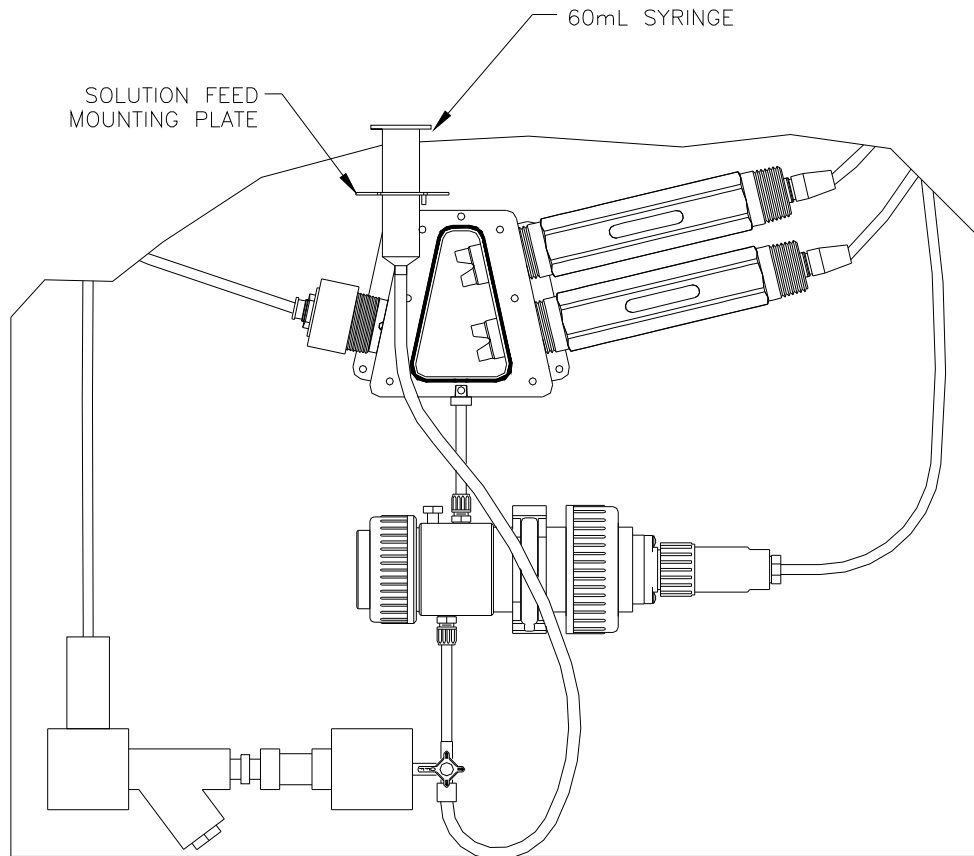


Figure 2 – Turbidity Standards Feed System (ATI-0677)

Calibration of pH, ORP, or Conductivity

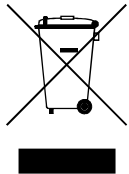
The sensors for conductivity, pH, and ORP are contained in the multi-sensor flowcell. They can be calibrated in one of two ways. The first is to collect sample from the drain of the system and measure these values with a portable instrument. Then simply adjust the monitors to the measured value.

The second method is to pour standards into the chamber and adjust to the standard values. A plug located on the top of the flowcell is provided as a port for filling the chamber with standard, and a funnel will make filling easier. Drain the flowcell as described in the turbidity calibration section above. Shut off the flow control valve at the top of the turbidity flowcell to isolate that sensor, and then remove the plug at the top of the multi-sensor flowcell. Pour either conductivity standard, buffer, or ORP standards into the chamber until the sensors are covered and then adjust the particular analyzer.

Chlorine Analyzer Calibration

Chlorine analyzers can only be calibrated while the system is running. The system should be operating normally for at least 15 minutes prior to calibration.

To calibrate, collect a sample of water from the drain and measure the chlorine residual with an amperometric titrator, DPD test kit, or other suitable test method. Adjust the analyzer to the



Equipment bearing this marking may not be discarded by traditional methods in the European community after August 12 2005 per EU Directive 2002/96/EC. End users must return old equipment to the manufacturer for proper disposal.